Claim Amendments

Claims 1-3 (Withdrawn)

4. (Currently Amended) Test kits for enabling BRCA1 gene testing comprising a combination of the primer pairs listed in Table 4 under "PRIMER SEQUENCES" column, mixed in about 20mM of Tris-HCl, 50mMKCl, 25pM of dNTP and 5% formamide.

5. (Previously added) The test kits of claim 4 wherein the gel or gel material is provided with about 20-65% of UF (urea and formamide).

6. (Previously added) Test kits for enabling hMLH1 gene testing comprising the short PCR primer pairs listed in Table 3 mixed in about 20mM of Tris-HC1, 50mM KCL, 25pM of d NTP and 5% formamide.

Claim 7-9 (Withdrawn)

10. (Currently amended) A method of detecting mutations in a BRCA1 genes ~~comprising~~ ~~providing~~ with the aid of PCR primers ~~capable of~~ for enabling amplifying the entire coding sequence of the BRCA1 genes, that comprises:

(a) amplifying a test sample containing nucleotide sequences by long distance multiplex PCR, ~~with exon fragments numbered 10-11, 12-13, 14-17, 18-20, and 21-24~~, using primer sequences SEQ ID N~~os~~OS. 33 and 34, 35 and 36, 37 and 38, 39 and 40, 41 and 42, 43 and 44, and 45 and 46~~, respectively, producing~~ to produce a first set of amplification products~~;~~ with exon fragments numbered 1-3, 14-17, 18-20, and 20-24, respectively;

(b) subjecting this first set of amplification products to short distance multiplex PCR to produce a second set of amplification products with (I) exon fragments numbered 11.1 ~~F and R~~ through 11.16 ~~F and R,~~ using primer sequence pairs SEQ ID Nos. 47 and 48 through 77 and 78, respectively, and (II) exon fragments numbered 2 ~~F and R~~ through 10 ~~F and R~~, and 12 ~~F and R~~ through 24 ~~F and R~~, using primer sequence pairs SEQ ID Nos. 79 and 80 through 119 and 120, respectively~~;~~

(c) ~~and with clamping and linking sequences therefor for effecting~~ using GC clamp attached to primers during said short distance multiplex PCR; and

(d) subjecting the second set of amplification products to two-dimensional gel electrophoresis to produce a characteristic spot pattern for ~~a~~ specific mutations in the BRCA1 gene.--

11. (Currently amended) The method of claim 10 wherein ~~non-defecting~~ gels and buffer materials are used so as to enable combined mixtures of multiple groups of BRCA1 genes to be subjected to the electrophoresis together

12. (Currently amended) The method of claim 10 wherein ~~an eleventh~~ said exon fragment 11.1 is the first of a fragment ~~has been~~ split 16 times to produce ~~said~~ exon fragments numbered 11.1 ~~F and R~~ through 11.16 ~~F and R~~. before said short distance multiplex PCR.

13. (Currently amended) The method of claim 10 wherein the primers for said ~~respective F and R~~ exon fragments numbered ~~2-5~~, 11.1, 11.2, 11.4-11.6, 11.9, 11.10, 11.12, 11.14, 11.16, 12-18, and 22-24 and 2-5 are each clamped by a pair of ~~clamping sequences~~. GC clamps.

14. (Currently Amended) The method of claim 10 wherein the primers for ~~respective F and R~~ said exon fragments numbered 6-10, 11.3, 11.7, 11.8, 11.11, 11.13, 11.15, and 19-21 are each clamped by a single ~~clamping sequence~~ GC clamp.

Please add and the following claims 15, 16 and 17.

15. (New) A method of detecting mutations in a BRCA1 gene with the aid of PCR primers for enabling amplifying the entire coding sequence of the BRCA1 gene, that comprises:

(a) amplifying a test sample containing nucleotide sequences by long distance multiplex PCR to produce a first set of amplification products with the exon fragments and using the primer sequences of Table 2 herein;

(b) subjecting this first set of amplification products to short distance multiplex PCR to produce a second set of amplification products with the exon fragments and using the primer sequences of Table 4 herein;

(c) using GC clamps attached to the primers of step (b) during said short distance multiplex PCR; and

(d) subjecting the second set of amplification products to two-dimensional gel electrophoresis to produce a characteristic spot pattern for specific mutations in the BRCA1 gene.

16. (New) The method of claim 15 wherein gels and buffer materials are used so as to enable combined mixtures of multiple groups of BRCA1 genes to be subjected to the electrophoresis together.

17. (New) Test kits for enabling BRCA1 gene testing in accordance with the method of claim 15 comprising a combination of the primer pairs listed in Table 4 under "PRIMER SEQUENCES" column, mixed in about 20 mM of Tris-Hcl, 50mM kcl, 25pM of dNTP and 5% formamide.